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**Interindustry Wage Differentials and
Efficiency Wages:
Some Canadian Evidence**

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and
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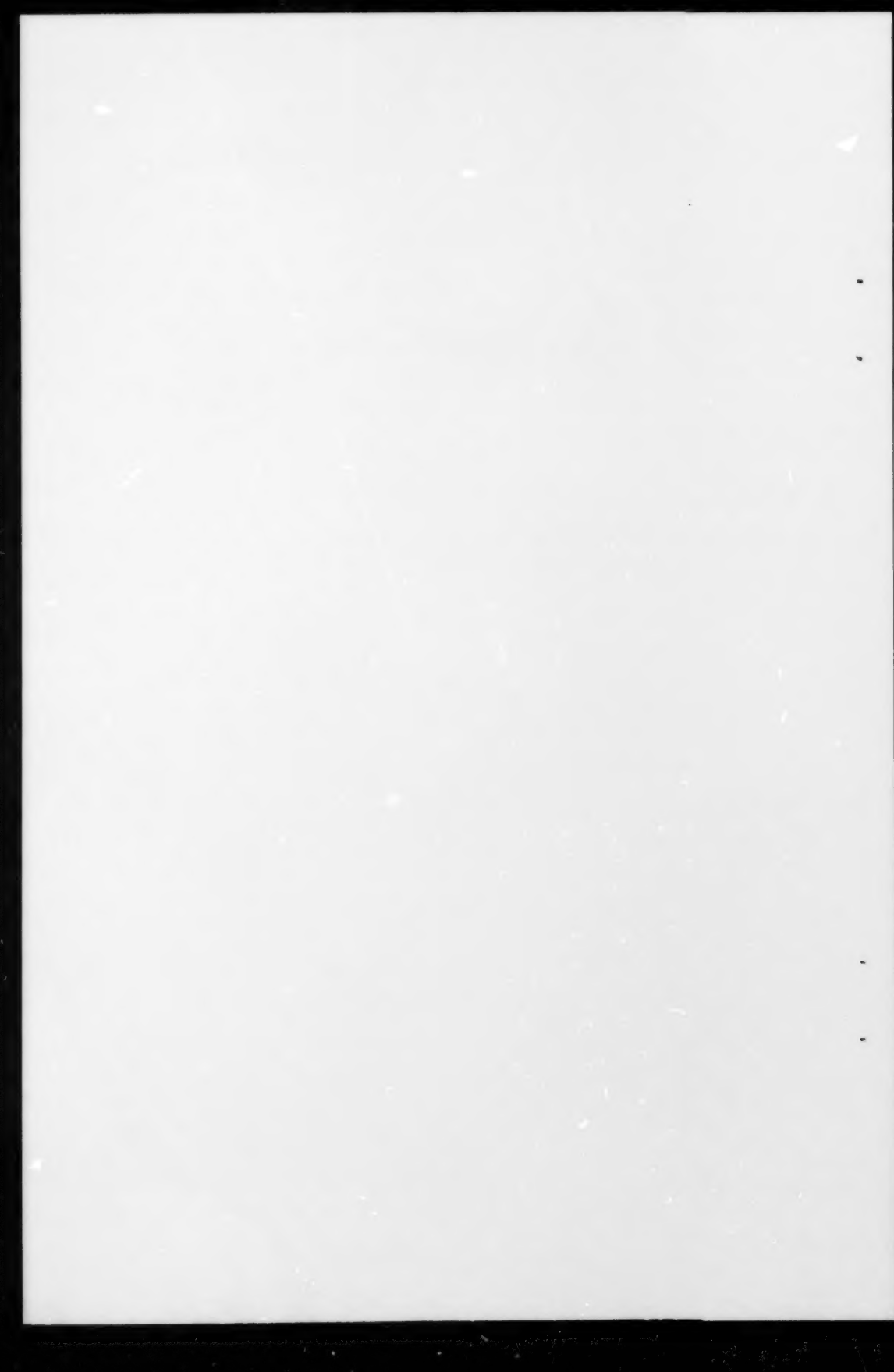
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Abstract

The existence of interindustry wage differentials is a well demonstrated empirical phenomenon. Workers with similar skills are paid differently across industries. The competitive models of the labour market suggest reasons why interindustry wage differentials occur. However, situations may arise where the wage differentials cannot be fully explained by the reasons provided in the competitive model. In such cases, the existence of these differentials is attributed to the fact that workers earn wage premiums or economic rents in their employment. Efficiency-wage theories provide an explanation of the existence of such rents. The main argument of these theories is that worker productivity (net of training and turnover costs) depends positively on the wage rate. The firms or industries may choose to pay wages above the market-clearing level in order to enhance worker productivity.

The purpose of this paper is to ascertain the nature of interindustry wage differentials in Canada. The research asks three questions:

- 1 What is the magnitude of interindustry wage differentials for equally skilled workers in Canada? Are these differentials stable over time?
- 2 Why do the interindustry wage differentials exist? Do these differentials represent "compensating differentials" (i.e., payment for differences in working conditions or in the productivity of the workers) or do they represent wage premiums or economic rents?
- 3 Can these wage differentials help explain the observed segmentation in the Canadian labour market and unemployment performance in the 1980s?

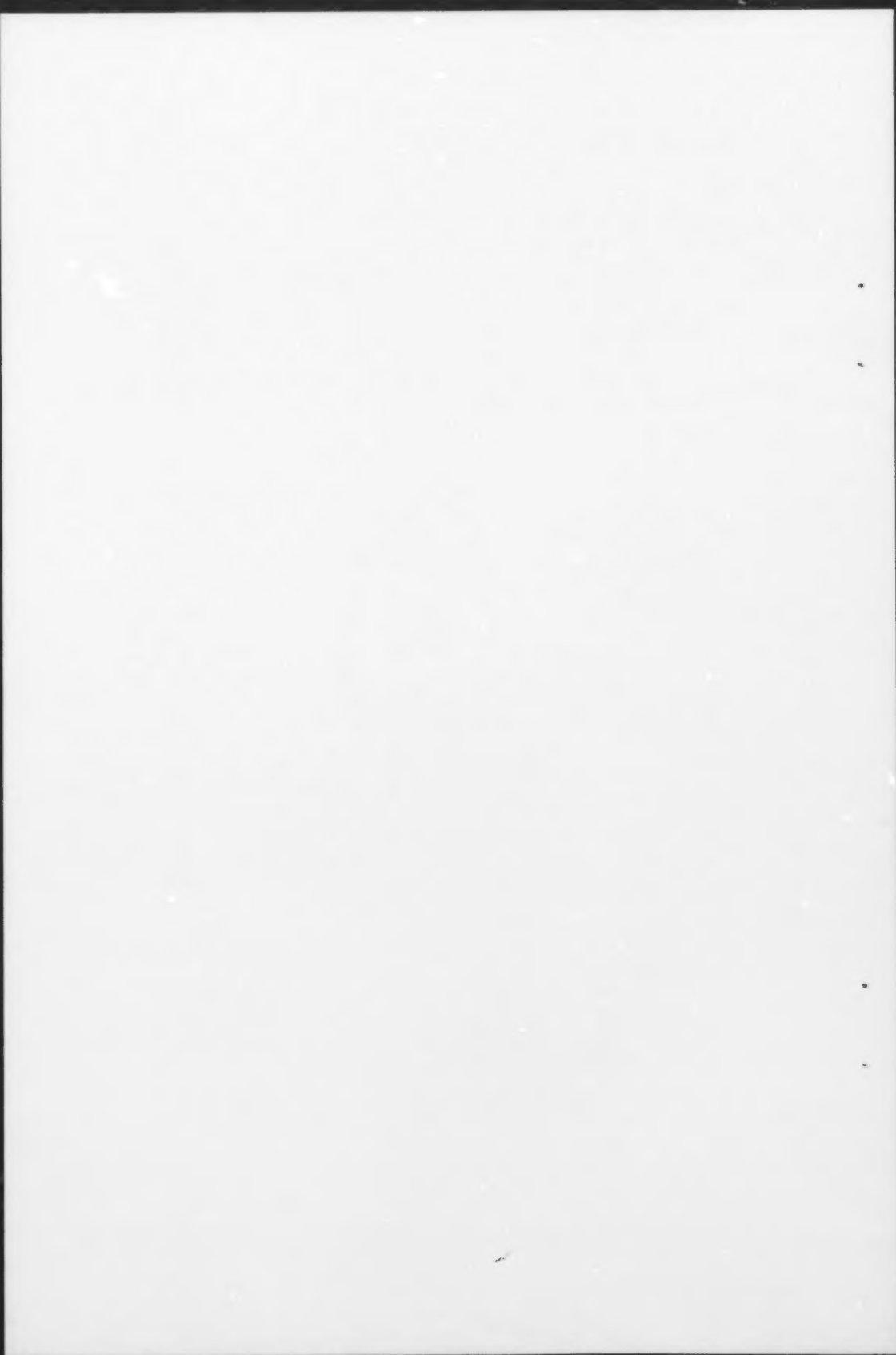
We estimate interindustry wage differentials at the one- and two-digit levels of industry aggregation, for various types of workers and for the different regions in Canada. The sample is drawn from the Labour Market Activity Survey of 1986 which provides data on the human capital and other personal attributes of individuals that affect wages. For reasons discussed in the paper, our sample excludes self-employed workers, as well as paid workers in agriculture, public administration, and defence.

The major findings are that substantial interindustry wage differentials exist and are relatively stable over time and space; that the pattern of interindustry wage differentials is very similar for workers in different occupations; and that these differentials cannot be explained by compensating factors. The differentials seem to be consistent with the rent-sharing explanations of the labour market, such as those based on the notion of efficiency wages.

Finally, the research indicates that while overall employment growth matters for a reduction in the rate of unemployment, what matters much more is growth in high-wage jobs. These findings suggest that the slow pace of job creation in high-wage industries, combined with the greater impact of high-wage employment growth on total unemployment, may help to explain why unemployment in the 1980s in Canada was so persistent. We suggest that policies that can improve the health of the high-wage sector – in particular, the manufacturing sector – could well represent a desirable policy goal.

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Foreword

In the 27th Annual Review of the Council, it was observed that persistence in unemployment can occur if there are rigidities in the labour market. One observed form of rigidity is the inability of wages to adjust to a fall in the demand for goods and services and, therefore, in the demand for labour. In economic downturns, the combination of a large unemployment pool and high, rigid wages will lead to persistent unemployment.

Empirical evidence suggests that some firms, in fact, do pay wages that are higher than the market-clearing level that equates labour demand and supply. The findings presented in this paper show that there are differences in the wages of equally skilled workers in different industries in Canada and that these differentials have been stable over time and across regions.

The challenge, then, is to explain why high-wage industries fail to lower wages when faced with an excess supply of labour. Economists have offered various explanations as to why some firms or industries pay higher wages to workers with skills similar to those in other firms or industries. One such explanation is based on the notion of efficiency wages, which argues that high wages stimulate higher worker productivity and stronger worker attachment to firms, and so reduce the costs to firms associated with employee turnover, hiring, and training.

The findings of this paper show that some industries do pay rents – i.e., wages higher than those available in the workers' best alternatives – to their workers. The authors find that industry wage premiums range from 33 per cent above the average economy-wide wage (for the tobacco industries) to 32 per cent below the average (for workers employed in health and welfare services and religious organizations).

The authors go on to investigate whether the existence of these interindustry wage differentials can help explain the persistence in unemployment over the 1980s. They suggest that while overall employment growth matters for a reduction in the rate of unemployment, what matters more is growth in high-wage jobs. One reason why unemployment in Canada was so persistent during the 1980s, according to the authors, is that the economy was slow to create jobs in the high-wage industries and that the workers who were displaced from the high-wage sectors during the 1981-82 recession preferred to wait for high-wage jobs, rather than accept less attractive low-wage jobs, thus contributing to a longer duration of unemployment.

This paper was prepared under the auspices of the Unemployment Issues Group of the Economic Council led by Surendra Gera, a senior economist on the staff of the Council. Gilles Grenier is associate professor of economics at

the University of Ottawa. At the time the research was undertaken, Mr. Grenier was a visiting research associate at the Council.

Judith Maxwell
Chairman

I Introduction

A major, empirically demonstrated fact in modern economies is the presence and persistence of substantial wage differentials between industries. Of course, interindustry wage differentials can be explained in part by the fact that industries differ from each other with respect to the amount of human capital that workers must have and with respect to the nonpecuniary aspects of jobs. Some industries, for example, employ more educated workers than others, while others have riskier work. But even after controlling for those differences, many studies have found that interindustry wage differentials remain large. This result is notable because it is a strong piece of evidence pointing to the presence of important elements of noncompetition in the labour market. In a truly competitive market, we would expect workers with similar productivity and job attributes to be remunerated the same way, regardless of the industry where they work; but that does not seem to be the case. The presence of interindustry wage differentials has led some economists to question the validity of standard theories about competitive labour markets and to propose some alternatives, such as the efficiency-wage theory, which emphasize the noncompetitive aspects of the labour market.

A number of explanations have been put forward in the literature to account for interindustry wage differentials. These can be grouped into three main classes: "competitive" explanations – that is, explanations that focus on interindustry differences in the characteristics of jobs that would cause wages to be higher in one industry (one, say, that employs a high proportion of skilled workers) than in another; "institutional" explanations, focusing on the nature of contractual arrangements between employers and workers, often reflected in the presence (or absence) of a union; and efficiency-wage explanations, which may account for the fact that workers in some industries are paid a wage premium (rent), compared with workers in other industries.

The main thrust of efficiency-wage theories is to explain why some employers seem to find it profitable, in some circumstances, to pay their workers a wage that is higher than what similar workers are paid in a competitive market. The main argument is that worker productivity (net of training and turnover costs) depends positively on the wage rate. As a consequence, high-wage employers may be reluctant to reduce wages even in the presence of an excess supply of labour, because they perceive that any cost savings they may realize as a result of such wage reductions would be more than offset by a related decrease in worker productivity. The major implication of efficiency-wage theory is that the existence of wage differentials is attributable to the fact that workers earn wage premiums or economic rents in their employment.

The purpose of this paper is to shed more light on the question of interindustry wage differentials, using recent Canadian data. More precisely, our objective is to try to answer the following questions. First, what is the magnitude of interindustry wage differentials for equally skilled workers in Canada? Are they stable over time? Second, why do these differentials exist? Do they represent compensating differentials, or do they represent economic rents, as

predicted by the efficiency-wage theories? And third, can these differentials help explain the labour market segmentation and the recent Canadian unemployment performance?

The structure of the paper is as follows. In Section II, we present evidence on interindustry wage differentials in Canada at two levels of industry aggregation. In Section III, we consider alternative explanations of interindustry wage differentials. From this analysis, we conclude that the large and persistent differentials that are observed cannot easily be accounted for by either the competitive explanations (based on differences in skill mix, compensating differentials, or temporary differentials) or by the institutional explanations. We do, however, find some support for efficiency-wage models as explanations for the observed pattern of interindustry wage differentials. The implications of the interindustry wage structure for recent Canadian experience with respect to labour market segmentation and unemployment are analysed in the fourth section, and the fifth section concludes the paper by reviewing the major findings and discussing their implications for policy.

II Interindustry Wage Differentials: Canadian Evidence

Interindustry wage differentials have been documented in many studies. The earlier studies typically compared average wages by industry and were limited to the manufacturing industries. More recent studies have included industries other than manufacturing and have controlled extensively for other factors affecting wages that may differ by industry. A thorough review of the evolution of the ranking and dispersion of wages in the manufacturing sector in Canada over the present century can be found in Ostry and Zaidi [1979, Chapter XII]. The authors observe that shifts in the ranking of average wages by industry are common in the early stages of industrialization; however, the ranking tends to become quite stable at later stages. The dispersion of interindustry wage differentials has been remarkably constant over time, although hourly wage rates have displayed a positive association with business cycles. Another important Canadian study is Kumar [1974], in which wage rates for two occupations – one skilled and one unskilled – in 26 Canadian manufacturing industries are examined. Kumar's main objective was to explain wages differentials by industry. To that effect, he linked the wage differentials to various characteristics of each industry, some of them reflecting the competitive environment and others reflecting institutional factors.¹

Many studies of interindustry wage differentials have been conducted in the United States and elsewhere. A recent analysis of some major findings is provided in Krueger and Summers [1987]. One important conclusion is that the pattern of interindustry wage differentials is very similar whether one considers their evolution over time or their distribution across industrialized countries. The pattern is also the same when particular groups of workers are compared (e.g., skilled and unskilled).

Magnitude of the Differentials

Using data from Statistics Canada's Labour Market Activity Survey (LMAS) for 1986, we estimate interindustry wage differentials at different levels of industry aggregation, for various types of workers and for the different regions in Canada. These differentials are obtained after controlling for individual differences in human capital and other personal attributes that can affect wages.

The main advantages of the LMAS survey are that: 1) it provides for a large number of control variables that affect wages; 2) industry categories are quite detailed (52 industries); and 3) information is available for more than one job for each individual, which makes it possible to analyse workers who changed jobs. The sample was stratified in order to give each Canadian region a sufficient number of observations. The weights used are those provided by the survey.

Our sample excludes self-employed workers and paid workers in agriculture, public administration, and defence, because the process that determines remuneration for those workers has some characteristics that may complicate a study of interindustry wage differentials. Thus we are left with 46 industries in the private and semiprivate sectors. Note that our choice of industries is similar to that of Krueger and Summers [1988]. This makes some comparisons easier. Most of our analysis is based on the first job that individuals held during the year 1986.² The total sample size is 32,945 observations.

The results of our analysis are reported in terms of the coefficients of industry dummy variables in regression equations where the dependent variable is the natural logarithm of hourly wages and where a standard set of variables that control for individual differences in human capital and other personal attributes that affect wages are included on the right-hand side in addition to the industry dummies. We do not show in our tables the coefficients of the control variables, but we do include the list of those variables and mention them in the discussion of the results whenever they are relevant. In order to make the interpretation of the results easier, the coefficients of the industry variables are restricted in such a way that the sum of the coefficients weighted by the share of each respective industry in total employment is equal to zero. As a result, each coefficient represents approximately the percentage difference in wages between an employee in a given industry and the average employee in all industries, with a positive coefficient indicating that an industry has a higher-than-average wage and a negative coefficient indicating the opposite. Note that, by using this restriction, we do not need to exclude any industry as reference category, as is normally done in regressions with dummy variables.

Since an important goal of the study is to investigate the ranking and dispersion of the interindustry wage differentials, we also report Spearman rank correlation coefficients between various distributions of industry regression coefficients and the weighted adjusted standard deviation (WASD) of

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interindustry wage differentials. This latter measure, which was also used by Krueger and Summers [1988], is computed from the following formula:

$$WASD(\beta) = [\text{var}(\hat{\beta}) - \sum_{i=1}^K (w_i \hat{\sigma}_i^2 / K)]^{1/2}$$

where $\text{var}(\hat{\beta})$ = weighted variance of the estimated industry coefficients;

K = the number of industries;

w_i = the weight of industry i where the sum of the weights is equal to the number of industries;

$\hat{\sigma}_i$ = the estimated standard error of the industry i regression coefficient.

The second term in the parenthesis is an adjustment factor that takes into account the fact that the regression coefficients are estimated with error.

We begin our analysis with Table 1, which presents the coefficients of industry dummies at the one-digit level, for a total of seven industry groups. We can see that those coefficients are all significantly different from zero. This means that interindustry wage differentials do exist, even after taking into account the fact that workers in the various industries do not have the same characteristics. We observe that trade and other services pay lower-than-average wages, while the other five industry groups pay higher-than-average wages, the "other primary" group being the one that pays the highest wage. Workers in the other primary industries (such as mining) are paid the highest wage; they earn approximately 18 per cent more than the average wage and, as a consequence, about 24 per cent more than similar workers in wholesale and retail trade. The weighted adjusted standard deviation of the differentials is about 7 per cent. The above results are similar to those obtained by Krueger and Summers [1988], using various data sets for the United States.

In Table 2, we report similar estimates – this time at the two-digit level. This provides a more detailed picture of interindustry wage differentials. The majority of the coefficients of the industry dummies are significantly different from zero, indicating again that interindustry wage differentials do exist. We can also see that it is important to distinguish among a larger number of industries because not all groups at the one-digit level have the same wage differential. In the table, each two-digit industry is labelled as either high-wage, low-wage, or medium wage, on the basis of the sign of its coefficient and of its level of significance. If the level of significance of the coefficient is greater than 90 per cent, we classify the industry as either low- or high-wage, depending on the sign. If the level of significance is less than 90 per cent, the industry is classified as medium-wage.

Table 1

Estimated Wage Differentials for One-Digit Industries,¹ Canada, 1986

	Industry coefficient
"Other" primary industries	0.177 (0.013)
Manufacturing	0.024 (0.005)
Construction	0.134 (0.012)
Transportation, communications, and utilities	0.080 (0.008)
Wholesale and retail trade	-0.063 (0.006)
Finance, insurance, and real estate	0.061 (0.009)
Other services	-0.053 (0.004)
<i>Weighted adjusted standard deviation of differentials²</i>	0.068
<i>Sample size</i>	32,945

1 Weighted ordinary least squares are used. The other explanatory variables include 5 education dummies, 1 head dummy, 6 age dummies, 3 marital status dummies, 1 sex dummy, 1 education/gender interaction, 6 age/gender interactions, 1 marital status/gender interaction, 13 occupation dummies, 5 regional dummies, 1 union membership dummy, 1 job tenure dummy, 4 employer-size dummies, 1 full-time/part-time job dummy, and a constant. The figures in parentheses are standard errors.

2 The weights used are the employment shares for 1986.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey, 1986.

Table 2

Estimated Wage Differentials for Two-Digit Industries,¹ Canada, 1986

	Industry wage status ¹	Industry coefficient
Other primary industries		
Forestry	HW	0.189 (0.0284)
Fishing and trapping	LW	-0.095 (0.048)
Metal mines	HW	0.189 (0.025)
Mineral fuels	HW	0.255 (0.025)
Nonmetal mines	HW	0.137 (0.071)
Quarries and sand pits	MW	0.008 (0.075)
Services incidental to mining	HW	0.227 (0.034)
Manufacturing industries		
Food and beverages	LW	-0.035 (0.013)
Tobacco products	HW	0.334 (0.072)
Rubber and plastics	HW	0.071 (0.023)
Leather	LW	-0.100 (0.038)
Textiles	LW	-0.190 (0.027)
Knitting mills	..	..
Clothing	LW	-0.081 (0.020)
Wood products	HW	0.087 (0.020)
Furniture and fixtures	LW	-0.144 (0.026)
Paper and allied products	HW	0.120 (0.019)
Printing, publishing, and allied industries	HW	0.064 (0.017)
Primary metals	HW	0.115 (0.019)

Table 2 (cont'd)

	Industry wage status ²	Industry coefficient
Metal fabricating	HW	0.037 (0.018)
Machinery	MW	0.008 (0.024)
Transportation equipment	HW	0.072 (0.014)
Electrical products	HW	0.026 (0.016)
Nonmetallic mineral products	HW	0.048 (0.031)
Petroleum and coal products	HW	0.208 (0.042)
Chemicals and chemical products	HW	0.144 (0.022)
Miscellaneous manufacturing	MW	-0.034 (0.026)
Construction industries		
General contractors	HW	0.114 (0.016)
Special-trade contractors	HW	0.170 (0.015)
Services incidental to construction	MW	-0.024 (0.072)
Transportation, communications, and utilities		
Transportation	HW	0.087 (0.010)
Storage	MW	0.063 (0.050)
Communications	HW	0.105 (0.013)
Electric power, gas, and water utilities	HW	0.144 (0.020)
Trade		
Wholesale trade	HW	0.038 (0.010)
Retail trade	LW	-0.111 (0.007)

Table 2 (cont'd)

	Industry wage status ²	Industry coefficient
Finance, insurance, and real estate		
Finance	HW	0.093 (0.012)
Insurance carriers	HW	0.137 (0.020)
Insurance agencies, real estate agencies	LW	-0.041 (0.017)
Other services		
Education and related services	MW	-0.010 (0.011)
Health and welfare	LW	-0.031 (0.008)
Religious organizations	LW	-0.318 (0.026)
Amusement and recreation	LW	-0.114 (0.020)
Services to business management	HW	0.048 (0.010)
Personal services	LW	-0.167 (0.018)
Accommodation and food services	LW	-0.203 (0.010)
Miscellaneous	LW	-0.028 (0.015)
<i>Weighted adjusted standard deviation of differentials</i>		0.151
<i>Sample size</i>		32,945

1 Weighted ordinary least squares are used. The other explanatory variables include 5 education dummies, 1 head dummy, 6 age dummies, 3 marital status dummies, 1 sex dummy, 1 education/gender interaction, 6 age/gender interactions, 1 marital status/gender interaction, 13 occupation dummies, 5 regional dummies, 1 union membership dummy, 1 job tenure dummy, 4 employer-size dummies, 1 full-time/part-time job dummy, and a constant.

The industry classification is based on the mapping of three-digit Standard Industrial Classification codes into 52 groups. The figures in parentheses are standard errors.

2 HW = high-wage; MW = medium-wage; LW = low-wage.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey; detailed 1980 SIC codes from Statistics Canada, *Standard Industrial Classification*, December 1980, cat. 12-501.

We find industry wage premiums that range from 33 per cent above the average (for the tobacco products industries) to 32 per cent below the average (for workers employed in health and welfare services and religious organizations). Some general observations can be made about the Canadian industry wage structure. Within the manufacturing group, workers in the tobacco, petroleum and coal products, chemical, paper, and primary-metal industries all have wages that are more than 10 per cent higher than average; by contrast, workers in the textile, furniture, and leather industries have wages that are 10 per cent or more lower than the average. Within the trade sector, we find that wages in retail are about 11 per cent lower than the average while wholesale trade has a slightly positive wage differential. Primary industries as a group are a high-wage sector, but fishing and trapping is a low-wage industry. The "other services" group is a low-wage sector, but services to business management are a high-wage industry.

Although our classification of industries is different from that of Krueger and Summers [1988], our results are in line with theirs. Note that the adjusted standard deviation of the differentials is about 15 per cent. This is larger than in the one-digit case, indicating a large amount of variation within the broad industry groups.

We now want to see how much of the total variation in the logarithm of wages can be attributed to the industry dummies and how much to the other control variables in the regressions. To do that, we report in Table 3 on the R^2 for specifications of the wage equation with and without the industry dummies. If the industry dummies and the other covariates were orthogonal, it would be possible to measure exactly the amount of variation in wages that is explained by the dummies. But since that is not the case, we can only provide upper and lower bounds for the influence of industry. In the regression presented in Table 2, where both the industry dummies and covariates are included, the R^2 is 0.462, which means that about 46 per cent of the total variation in log wages is explained by the variables included in the regression. If the regression with the same data is run only with the covariates, we find that 43.5 per cent of the total variation can be explained by the variables included in the regression. Thus the difference of 2.7 percentage points (46.2 - 43.5) is an estimate of the effect of the industry dummies on the variation in wages. However, this procedure can be done in reverse by doing the regression first on the industry dummies alone and then adding the covariates. If that procedure is followed, the explained variation in log wages when only the industry variables are included is 20.5 per cent, which provides another estimate of the effect of industry. The large difference between the two estimates reflects the fact that industry and the other covariates are highly correlated. This analysis is similar to the one performed by Dickens and Katz [1987] with U.S. data. Our estimated industry effects are lower than theirs because they included more than 200 industries in their regressions, while we included only 46. Nevertheless, our results do indicate that industry plays an important role in wage determination.

Table 3

Analysis of the Sources of Wage Variation, Canada, 1986

	Share of total sum of squares
Sources of variation: ¹	
Covariates and industry (RCI)	0.462
Error (1 - RCI)	0.538
Covariates alone (RC)	0.435
Industry (RCI - RC)	0.027
Industry alone (RI)	0.205
Covariates (RCI - RI)	0.257
Variance of natural log wage	80.869
Standard deviation of natural wage	8.993
Mean of natural log wage	2.274
<i>Total number of observations</i>	<i>32,945</i>
<i>Number of industries</i>	<i>47</i>
<i>Number of covariates</i>	<i>44</i>

1 RCI = the R^2 from a (natural) log wage regression that includes both the covariates and industry dummies;

RC = the R^2 from a regression of (natural) log wage on the covariates alone;

RI = the R^2 from a regression of (natural) log wage on industry dummies alone.

Weighted ordinary least squares are used. The other explanatory variables include 5 education dummies, 1 head dummy, 6 age dummies, 3 marital status dummies, 1 sex dummy, 1 education/gender interaction, 6 age/gender interactions, 1 marital status/gender interaction, 13 occupation dummies, 5 regional dummies, 1 union membership dummy, 1 job tenure dummy, 4 employer-size dummies, 1 full-time/part-time job dummy, and a constant.

The industry classification is based on the two-digit Standard Industrial Classification codes.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey, 1986.

III Alternative Explanations of Industry Wage Differentials

It is clear from the discussion above that significant wage differentials exist across industries. In the discussion that follows, we consider three broad explanations as to why some industries pay higher wages to workers with skills similar to those in other industries.

Competitive Explanations

A number of explanations consistent with standard competitive-labour-market models can be offered to account for interindustry wage differentials, even after controlling for measured human-capital variables. These explanations imply that differences across industries in wage levels are "compensating differentials," related to differences across industries in the characteristics of jobs or human-capital (skill) requirements. For example, interindustry wage differentials may represent differences in working conditions – workers in some industries receive higher wages for night-shift work, for instance [see, for example, Kostiuk, 1990]. Compensating wage premiums may also exist for work hazards such as risk of injury or death.³ Alternatively, temporary wage differentials may exist because of shifts in labour demand or supply across sectors and imperfect short-run mobility of labour. According to this class of explanations, if all characteristics of workers and jobs could be observed, there would be no unexplained wage differentials.

Occupational Structure and Wage Differentials

One possibility is that the large wage differentials represent interindustry differences in skill mix or in job characteristics. If that were the case, we would expect the differentials to be smaller when applied to a subgroup of workers that is homogeneous in terms of the tasks performed than when applied to all workers. To evaluate this hypothesis, we present in Table 4 interindustry wage differentials at the two-digit level separately for white-collar and blue-collar workers. Although there are some differences in the coefficients and a few changes in signs, the classification of high- and low-wage industries remains the same in the majority of cases for both white-collar and blue-collar workers. In addition, the weighted adjusted standard deviation of differentials does not decrease when both kinds of workers are analysed separately. It is, in fact, higher than the one for all workers in the case of white-collar workers, while it is only slightly lower in the case of blue-collar workers. In Table 5 we consider wage differentials for three specific occupations: managerial, clerical, and fabrication. Those occupations have the characteristics that they are represented in almost all the industries that we consider. We can see that the differentials are again very similar for workers in those occupations. Thus the above results provide evidence against the explanation that interindustry wage differentials are largely caused by differences in the characteristics of jobs. Similar findings are reported by Dickens and Katz [1986] for the United States.

Table 4

Estimated Wage Differentials for Two-Digit Industries,¹ Canada, 1986

	Industry wage status ¹	Industry coefficient	
		White-collar workers	Blue-collar workers
Other primary industries			
Forestry	HW	0.114 (0.065)	0.138 (0.029)
Fishing and trapping	LW	0.278 (0.138)	-0.194 (0.046)
Metal mines	HW	0.101 (0.047)	0.183 (0.027)
Mineral fuels	HW	0.302 (0.035)	0.160 (0.035)
Nonmetal mines	HW	0.176 (0.126)	0.065 (0.079)
Quarries and sand pits	MW	-0.001 (0.221)	-0.025 (0.072)
Services incidental to mining	HW	0.236 (0.064)	0.166 (0.037)
Manufacturing industries			
Food and beverages	LW	-0.081 (0.026)	-0.054 (0.014)
Tobacco products	HW	0.267 (0.094)	0.384 (0.106)
Rubber and plastics	HW	0.109 (0.039)	0.020 (0.025)
Leather	LW	-0.019 (0.081)	-0.139 (0.039)
Textiles	LW	-0.124 (0.058)	-0.231 (0.028)
Knitting mills	..	..	..
Clothing	LW	0.112 (0.038)	-0.159 (0.022)
Wood products	HW	0.067 (0.045)	0.032 (0.020)
Furniture and fixtures	LW	-0.160 (0.056)	-0.186 (0.026)
Paper and allied products	HW	0.191 (0.038)	0.049 (0.020)
Printing, publishing, and allied industries	HW	0.050 (0.024)	0.072 (0.023)

Table 4 (cont'd)

	Industry wage status ¹	Industry coefficient	
		White-collar workers	Blue-collar workers
Primary metals	HW	0.221 (0.038)	0.036 (0.019)
Metal fabricating	HW	0.033 (0.036)	0.013 (0.018)
Machinery	MW	0.028 (0.038)	-0.029 (0.029)
Transportation equipment	HW	0.087 (0.027)	0.029 (0.014)
Electrical products	HW	0.059 (0.025)	-0.016 (0.020)
Nonmetallic mineral products	HW	-0.059 (0.079)	0.020 (0.030)
Petroleum and coal products	HW	0.095 (0.058)	0.318 (0.058)
Chemicals and chemical products	HW	0.148 (0.031)	0.119 (0.028)
Miscellaneous manufacturing	MW	0.026 (0.041)	-0.084 (0.031)
Construction industries			
General contractors	HW	0.084 (0.030)	0.087 (0.017)
Special-trade contractors	HW	0.111 (0.033)	0.138 (0.015)
Services incidental to construction	MW	-0.033 (0.082)	0.055 (0.158)
Transportation, communications, and utilities			
Transportation	HW	0.131 (0.018)	0.019 (0.011)
Storage	MW	0.071 (0.06)	0.034 (0.077)
Communications	HW	0.142 (0.015)	0.048 (0.025)
Electric power, gas, and water utilities	HW	0.169 (0.030)	0.101 (0.026)

Table 4 (cont'd)

		Industry coefficient	
	Industry wage status ¹	White-collar workers	Blue-collar workers
Trade			
Wholesale trade	HW	0.046 (0.012)	-0.015 (0.017)
Retail trade	LW	-0.123 (0.008)	-0.089 (0.012)
Finance, insurance, and real estate			
Finance	HW	0.106 (0.013)	-0.114 (0.116)
Insurance carriers	HW	0.149 (0.021)	-0.319 (0.304)
Insurance agencies, real estate agencies	LW	-0.022 (0.017)	-0.123 (0.072)
Other services			
Education and related services	MW	0.028 (0.011)	-0.065 (0.035)
Health and welfare	LW	0.043 (0.008)	-0.827 (0.032)
Religious organizations	LW	-0.310 (0.027)	0.105 (0.153)
Amusement and recreation	LW	-0.088 (0.022)	-0.138 (0.045)
Services to business management	HW	0.058 (0.011)	0.093 (0.037)
Personal services	LW	-0.157 (0.019)	-0.122 (0.057)
Accommodation and food services	LW	-0.181 (0.010)	-0.290 (0.044)
Miscellaneous	LW	-0.014 (0.167)	-0.040 (0.030)
Weighted adjusted standard deviation of differentials ³		0.189	0.136
Sample size		21,273	11,671
R ²		0.483	0.46
Spearman correlation coefficient		0.49	

Table 4 (cont'd)

- 1 Weighted ordinary least squares are used. The other explanatory variables include 5 education dummies, 1 head dummy, 6 age dummies, 3 marital status dummies, 1 sex dummy, 1 education/gender interaction, 6 age/gender interactions, 1 marital status/gender interaction, 13 occupation dummies, 5 regional dummies, 1 union membership dummy, 1 job tenure dummy, 4 employer-size dummies, 1 full-time/part-time job dummy, and a constant. The figures in parentheses are standard errors. Each column is estimated from a separate cross-sectional regression.
- 2 HW = high-wage; MW = medium-wage; LW = low-wage.
- 3 The weights used are the employment shares for 1986.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey, 1986.

Table 5

**Estimated Wage Differentials for Three Occupational Groups,¹
Canada, 1986**

		Industry coefficient		
	Industry wage status ²	Managerial	Fabrication	Clerical
Other primary industries				
Forestry	HW	0.071 (0.161)	0.203 (0.112)	0.059 (0.094)
Fishing and trapping	LW	-0.301 (0.796)	0.033 (0.824)	0.477 (0.178)
Metal mines	HW	0.048 (0.121)	0.319 (0.070)	0.278 (0.107)
Mineral fuels	HW	0.242 (0.078)	0.172 (0.098)	0.244 (0.071)
Nonmetal mines	HW	0.224 (0.191)	0.114 (0.175)	-0.040 (0.246)
Quarries and sand pits	MW	..	-0.052 (0.234)	-0.103 (0.510)
Services incidental to mining	HW	0.254 (0.150)	0.177 (0.158)	0.112 (0.103)
Manufacturing industries				
Food and beverages	LW	-0.190 (0.059)	0.143 (0.054)	-0.102 (0.035)
Tobacco products	HW	0.436 (0.266)	0.389 (0.176)	0.095 (0.143)

Table 5 (cont'd)

	Industry wage status ²	Industry coefficient		
		Managerial	Fabrication	Clerical
Rubber and plastics	HW	0.084 (0.089)	0.061 (0.036)	0.078 (0.048)
Leather	LW	-0.051 (0.126)	-0.083 (0.047)	-0.164 (0.140)
Textiles	LW	-0.288 (0.126)	-0.285 (0.052)	-0.149 (0.074)
Knitting mills	..	..	..	..
Clothing	LW	0.275 (0.078)	-0.117 (0.028)	-0.034 (0.071)
Wood products	HW	0.063 (0.093)	0.135 (0.042)	-0.008 (0.072)
Furniture and fixtures	LW	-0.011 (0.132)	-0.165 (0.036)	-0.246 (0.088)
Paper and allied products	HW	0.215 (0.101)	0.077 (0.045)	0.140 (0.0153)
Printing, publishing, and allied industries	HW	-0.031 (0.068)	0.034 (0.098)	0.056 (0.042)
Primary metals	HW	0.209 (0.098)	0.171 (0.049)	0.179 (0.056)
Metal fabricating	HW	-0.080 (0.069)	0.043 (0.041)	0.056 (0.047)
Machinery	MW	-0.137 (0.072)	-0.057 (0.052)	-0.090 (0.062)
Transportation equipment	HW	-0.007 (0.061)	0.111 (0.020)	0.163 (0.040)
Electrical products	HW	0.003 (0.045)	0.060 (0.024)	0.082 (0.045)
Nonmetallic mineral products	HW	-0.354 (0.158)	0.139 (0.083)	0.144 (0.132)
Petroleum and coal products	HW	0.195 (0.131)	0.380 (0.191)	0.130 (0.112)
Chemicals and chemical products	HW	0.162 (0.068)	0.062 (0.086)	0.050 (0.048)
Miscellaneous manufacturing	MW	0.121 (0.091)	0.010 (0.045)	-0.086 (0.066)

Table 5 (cont'd)

		Industry coefficient		
	Industry wage status ²	Managerial	Fabrication	Clerical
Construction industries				
General contractors	HW	-0.068 (0.064)	0.152 (0.092)	0.149 (0.041)
Special-trade contractors	HW	0.049 (0.080)	0.247 (0.053)	0.039 (0.040)
Services incidental to construction	MW	-0.132 (0.124)	..	0.014 (0.130)
Transportation, communications, and utilities				
Transportation	HW	0.104 (0.046)	0.122 (0.032)	0.030 (0.023)
Storage	MW	0.239 (0.121)	0.091 (0.165)	-0.020 (0.075)
Communications	HW	0.080 (0.039)	0.052 (0.079)	0.127 (0.019)
Electric power, gas, and water utilities	HW	0.051 (0.078)	0.024 (0.078)	0.170 (0.039)
Trade				
Wholesale trade	HW	0.026 (0.028)	0.024 (0.034)	-0.021 (0.018)
Retail trade	LW	-0.124 (0.019)	-0.067 (0.019)	-0.128 (0.012)
Finance, insurance, and real estate				
Finance	HW	0.090 (0.024)	..	0.039 (0.014)
Insurance carriers	HW	0.112 (0.049)	..	0.040 (0.028)
Insurance agencies, real estate agencies	LW	-0.142 (0.047)	-0.246 (0.209)	0.060 (0.035)
Other services				
Education and related services	MW	-0.030 (0.035)	-0.032 (0.089)	-0.015 (0.019)
Health and welfare	LW	0.160 (0.035)	-1.165 (0.058)	0.021 (0.016)

Table 5 (cont'd)

	Industry wage status ²	Industry coefficient		
		Managerial	Fabrication	Clerical
Religious organizations	LW	-0.707 (0.106)	..	-0.150 (0.050)
Amusement and recreation	LW	-0.086 (0.070)	-0.246 (0.098)	-0.127 (0.038)
Services to business management	HW	0.087 (0.028)	0.088 (0.072)	-0.005 (0.016)
Personal services	LW	-0.333 (0.118)	-0.293 (0.087)	-0.217 (0.060)
Accommodation and food services	LW	-0.183 (0.033)	0.179 (0.301)	-0.229 (0.029)
Miscellaneous	LW	0.023 (0.043)	0.108 (0.074)	0.088 (0.028)
<i>Weighted adjusted standard deviation of differentials³</i>		0.182	0.204	0.159
<i>Sample size</i>		3,345	2,815	5,463
<i>R²</i>		0.376	0.514	0.346

1 Weighted ordinary least squares are used. The other explanatory variables include 5 education dummies, 1 head dummy, 6 age dummies, 3 marital status dummies, 1 sex dummy, 1 education/gender interaction, 6 age/gender interactions, 1 marital status/gender interaction, 13 occupation dummies, 5 regional dummies, 1 union membership dummy, 1 job tenure dummy, 4 employer-size dummies, 1 full-time/part-time job dummy, and a constant. The figures in parentheses are standard errors. Each column is estimated from a separate cross-sectional regression.

2 HW = high-wage; MW = medium-wage; LW = low-wage.

3 The weights used are the employment shares for 1986.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey, 1986.

Different Patterns of Human-Capital Accumulation

A second possible explanation for the existence of industry wage differences is that they arise from differences in patterns of human-capital accumulation across industries and that such differences are related to individual characteristics such as age, length of job tenure, gender, and level of educational attainment.

Table 6 shows the correlation and dispersion of interindustry wage differentials for different types of workers. In both cases, we find that the dispersion is greater for employees who have supposedly acquired less specific human capital (young workers and other short-tenure workers). Therefore, interindustry wage differentials do not appear to be the result of older or longer-term workers sharing a larger rent.

Table 6

**Alternative Samples and Estimated Industry Wage Differentials,¹
Canada, 1986**

	Weighted adjusted standard deviation of industry wage differentials ²	Spearman correlation coefficient	Sample size
Age			
20 to 24	0.176	0.597	4,376
45 to 64	0.143		8,134
Tenure			
Up to 2 years	0.178	0.754	12,068
Greater than 8 years	0.129		10,080
Sex			
Males	0.143	0.749	17,594
Females	0.162		15,350
Education			
Elementary and high school	0.169	0.524	21,476
University	0.179		3,864
Firm size			
Between 1 and 99 employees	0.175	0.687	14,395
500 or more employees	0.165		9,539

1 Weighted ordinary least squares are used. The other explanatory variables include 5 education dummies, 1 head dummy, 6 age dummies, 3 marital status dummies, 1 sex dummy, 1 education/gender interaction, 6 age/gender interactions, 1 marital status/gender interaction, 13 occupation dummies, 5 regional dummies, 1 union membership dummy, 1 job tenure dummy, 4 employer-size dummies, 1 full-time/part-time job dummy, and a constant. Each row is estimated from a separate cross-section regression.

2 Based on estimated wage differentials for two-digit industries. The weights used are the employment shares for 1986.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey, 1986.

Interindustry wage differentials are related to the gender and education composition of labour force, since it has been shown that low-wage industries tend to have a larger proportion of female and low-educated workers than high-wage industries. However, Table 6 shows that the dispersion is about the same when males and females and low- and high-educated workers are considered separately. Thus the sex and education composition of the labour force is not a major factor in explaining interindustry wage differentials.

Firm size has also been emphasized as an important factor in explaining wage differentials [see Brown and Medoff, 1989]. Table 6 shows the dispersion of interindustry wage differentials for small and large firms. Since we find that the dispersion is about the same for both firm sizes, this factor does not appear to play an important role in the explanation of interindustry wage differentials.

We conclude from this evidence that variations in age, job tenure, sex, education, and firm size cannot account for much of the variation in wages that is observed across industries.

Stability in the Industry Wage Structure

A third explanation for industry wage premiums is that they exist because of short-run immobility of labour or temporary labour-demand shocks. Table 7 shows estimated wage differentials for industry groups based on census data for the years 1970, 1980, and 1985. The results show that the industry wage structure was similar in each of those years: the other primary industries group consistently paid the highest wages, and the trade industries group consistently paid the lowest, while the ranking of the other industries changed only slightly. The dispersion of interindustry wage differentials, as indicated by the weighted adjusted standard deviation of differentials, is also quite constant.⁴

Industry wage differentials appear to be fairly constant over space as well. Table 8 shows the variation in industry wage differentials for five Canadian regions in 1986. Although the weighted adjusted standard deviation varies somewhat – from 13.6 per cent in Ontario to 18 per cent in British Columbia – the results indicate that the dispersion across regions is of the same order of magnitude. The above results are consistent with the general conclusion of other studies that interindustry wage differentials are relatively constant over space and time [see, for example, Krueger and Summers, 1988].

Table 7

**Estimated Wage Differentials for One-Digit Industries,¹
Canada, 1970, 1980, and 1985**

	1970	1980	1985
Other primary industries	0.234 (0.032)	0.270 (0.030)	0.313 (0.033)
Manufacturing	0.062 (0.010)	0.043 (0.010)	0.068 (0.011)
Construction	0.115 (0.022)	0.082 (0.022)	0.042 (0.025)
Transportation, communications, and utilities	0.105 (0.015)	0.129 (0.015)	0.147 (0.016)
Trade	-0.104 (0.012)	-0.112 (0.011)	-0.108 (0.012)
Finance, insurance, and real estate	0.030 (0.021)	0.038 (0.017)	0.051 (0.018)
Other services	-0.092 (0.011)	-0.065 (0.010)	-0.070 (0.009)
<i>Weighted adjusted standard deviation of differentials²</i>	0.105	0.090	0.102
<i>R²</i>	0.666	0.573	0.539
<i>Sample size</i>	14,994	17,433	19,161

1 The other explanatory variables include education, experience, experience squared, marital status, 4 dummies for weeks worked, 6 dummies for hours worked per week, a sex dummy, a sex dummy interacted with education, experience and marital status, 15 occupation dummies, and 4 regional dummies. The figures in parentheses are standard errors.

2 Weights are the employment shares in each census.

Source Estimates by the authors, based on data from the 1971, 1981, and 1986 censuses.

Table 8

Estimated Industry Wage Differentials,¹ Canada, by Region, 1986

	Weighted adjusted standard deviation of industry wage differentials ²	Sample size	R ²
Canada	0.151	32,945	0.462
Regions			
Atlantic provinces	0.158	8,090	0.499
Ontario	0.136	6,917	0.476
Quebec	0.168	5,180	0.499
Prairie provinces	0.160	9,576	0.431
British Columbia	0.180	3,179	0.447

1 Weighted ordinary least squares are used. The other explanatory variables include 5 education dummies, 1 head dummy, 6 age dummies, 3 marital status dummies, 1 sex dummy, 1 education/gender interaction, 6 age/gender interactions, 1 marital status/gender interaction, 13 occupation dummies, 5 regional dummies, 1 union membership dummy, 1 job tenure dummy, 4 employer-size dummies, 1 full-time/part-time job dummy, and a constant. Each row is estimated from a separate cross-section regression.

2 Based on estimated wage differentials for two-digit industries. The weights used are the employment shares for 1986.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey, 1986.

Labour Quality

According to the unmeasured-labour-quality argument, wage differentials might be explained by differences in workers' productive abilities that are not captured by the measures of labour quality available in the individual-based micro dataset. Empirically, that is a difficult proposition to test. Krueger and Summers [1988] suggest that one should look at how observed measures of labour quality (such as educational attainment) differ across industries. According to this view, if interindustry wage differentials are attributable to measured and unmeasured differences in labour quality across industries, one would expect a substantial drop in the dispersion of industry wages, once measured human capital is controlled for.

To test this argument, we examine first the impact of alternative degrees of control for human capital on industry wage differentials (Table 9). The results show that the inclusion of human-capital controls leads to a decline of about 4 percentage points in the standard deviation of the wage differentials in 1986.

A major point is that even after controlling for age, education, and tenure, the standard deviation of industry wages remains above 15 per cent. Krueger and Summers' findings for the United States suggest that the addition of these variables reduces the standard deviation of the wage differentials only by 1 percentage point in 1979. On the basis of our findings and of the U.S. results regarding the importance of the observed labour-quality proxies, it is difficult to accept the view that the unobserved characteristics play a significant role in explaining interindustry wage differentials.⁵

Table 9

Alternative Degrees of Control for Human Capital on Industry Wage Differentials, Canada, 1986

	Weighted adjusted standard deviation of industry wage differentials ¹
Control:	
1 Head dummy, marital status dummies, sex dummy, marital status/sex interactions, 13 occupation dummies, 5 region dummies, union dummy, employer size dummy, full-time job dummy	0.188
2 Row 1 controls plus 6 age dummies and 1 age/sex interaction	0.170
3 Row 2 controls plus 5 education dummies and 1 education/sex interaction	0.154
4 Row 3 controls plus tenure variable	0.151

1 Based on estimated industry wage differentials for two-digit industries.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey, 1986.

Second, the problem of unmeasured labour quality can be addressed by using longitudinal data. Longitudinal data that follow individuals as they change industries enable one to control for time-invariant unmeasured labour quality. The evidence presented here pertains to those individuals who separated from the first job they held in 1986 and found a second job during the year. The dataset contains 32,945 first-job holders; 1,996 of those workers left their job in 1986 and found another in a different two-digit industry during the year.

Our focus is whether the interindustry wage differentials estimated for a sample of industry changers are the same as for a cross-section of workers. The results, presented in Table 10, show that the weighted adjusted standard

deviation of the wage differential for industry changers at the two-digit level was 0.155. This result is similar to that reported in Table 2 for a cross-section of workers. It suggests that job separators receive the industry wage premium attached to their new job. Similar findings, based on longitudinal datasets, are reported by Krueger and Summers [1988] for the United States. These results do not support the hypothesis that estimated interindustry wage differences are largely attributable to the unobserved productive ability of the worker.

Table 10

Industry Changers and Estimated Industry Wage Differentials,¹ Canada, 1986

	Weighted adjusted standard deviation of industry wage differentials ²	Sample size	R ²
All industry changers	0.155	1,996	0.490
Industry changers: job leavers ³	0.175	1,043	0.528
Industry changers: job losers ⁴	0.155	853	0.496

1 Weighted ordinary least squares are used. The other explanatory variables include 5 education dummies, 1 head dummy, 6 age dummies, 3 marital status dummies, 1 sex dummy, 1 education/gender interaction, 6 age/gender interactions, 1 marital status/gender interaction, 13 occupation dummies, 5 regional dummies, 1 union membership dummy, 1 job tenure dummy, 4 employer-size dummies, 1 full-time/part-time job dummy, and a constant. Each row is estimated from a separate cross-section regression.

2 Based on estimated wage differentials for two-digit industries. The weights used are the employment shares for 1986.

3 Job leavers include those who quit their job for personal and nonpersonal reasons: *personal reasons* include: personal or family responsibilities (including changes in family circumstances, serious family illness etc.); changed residence; and retirement; *nonpersonal reasons* include: dissatisfied with job (for reasons of) low pay, no opportunity for advancement, no opportunity to use training or skills, working conditions including physical conditions, transportation problems and hours of work, other; worried about layoff, job security or reduction in hours; found new job; and going to school.

4 Job losers include those who lose their job for the following reasons: *job losses*: employer-initiated separations; seasonal nature of job; nonseasonal economic or business conditions; company moving or going out of business; installation of, or conversion to new equipment; an on-call arrangement; end of a temporary nonseasonal job; dismissal by the employer; sale of the business firm; *job interruptions*: temporary job separations; bad weather; labour dispute (strike or lockout); unpaid vacation.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey, 1986.

Table 11

Estimated Wage Differentials for One-Digit Industries¹ Levels and First Differences, Canada, 1986

	Levels ²	First difference	
		All job changes	Involuntary job changes
Other primary industries	0.177 (0.013)	0.083 (0.037)	0.041 (0.049)
Manufacturing	0.024 (0.005)	0.044 (0.016)	0.021 (0.026)
Construction	0.134 (0.012)	0.105 (0.023)	0.055 (0.029)
Transportation, communications, and utilities	0.080 (0.008)	0.038 (0.025)	-0.015 (0.041)
Wholesale and retail trade	-0.063 (0.006)	-0.016 (0.013)	-0.0001 (0.024)
Finance, insurance, and real estate	0.061 (0.009)	0.083 (0.026)	0.020 (0.054)
Other services	-0.053 (0.004)	-0.057 (0.010)	-0.055 (0.020)
<i>Weighted adjusted standard deviation of differentials³</i>	0.068	0.068	0.042
<i>Sample size</i>	32,945	4,601	1,503

1 Weighted ordinary least squares are used. The other explanatory variables include 5 education dummies, 1 head dummy, 6 age dummies, 3 marital status dummies, 1 sex dummy, 1 education/gender interaction, 6 age/gender interactions, 1 marital status/gender interaction, 13 occupation dummies, 5 regional dummies, 1 union membership dummy, 1 job tenure dummy, 4 employer-size dummies, 1 full-time/part-time job dummy, and a constant. The figures in parentheses are standard errors.

2 Results reported from Table 1.

3 The weights used are the employment shares for 1986.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey, 1986.

The LMAS data show that about 39 per cent of the individuals separated from their first job in 1986 were laid off – i.e., were separated for involuntary reasons – while about 54 per cent left their job voluntarily. In order to determine the extent to which industry premiums are retained for job leavers and job losers, we examined the impact on wages of changing industries for both groups. The results in Table 10 show that both job leavers and job losers

who change industry receive the wage premium of the industry that they join but that the dispersion of the wage premium is higher for job quitters by about 2 percentage points.

Table 11 reports the level results for one-digit industries (those reported in Table 1) and the results of the regression on the first differences of the variables for all job changers and involuntary job changers. We can see that the first-difference results for all job changers are similar to level results. In both cases, high- and low-wage industries are the same. The adjusted standard deviation is also similar in both cases. When the first-difference results for involuntary job changers are considered, the results are almost similar, but much less significant. In this case, the sample size is much smaller (about 1,500). On the basis of the longitudinal results, it does not appear that unmeasured labour quality is a significant factor in explaining interindustry wage differentials.⁶

Compensating Differentials

A fifth possible explanation is that industry wage differentials reflect "compensating" differentials – that is, workers are compensated for nonwage aspects of the industry, such as undesirable working conditions. These may include, for example, nonstandard weekly hours, shift work, or the presence of risk of injury or health hazards.

Providing empirical evidence on compensating differentials is difficult. The available data do not enable us to examine directly the impact of working conditions on industry wage differentials. There are, however, various considerations that suggest that these differentials do not reflect the type of compensating differences discussed here. First, Krueger and Summers [1988] find that the inclusion of working-condition variables barely affects the estimated wage premiums in the United States. In fact, they find that the dispersion tends to increase rather than decrease when those variables are taken into consideration. Moreover, the consideration of fringe benefits tends to expand wage differences as well. On the basis of these findings, the authors conclude that wage differentials exist over and above what can be explained by compensating factors.⁷

A second possible dimension of compensating differentials is full-time versus part-time work. The LMAS dataset enables us to examine industry wage differentials for both categories of workers separately (Table 12). The industry wage premiums for full-time workers are not substantially different from those of the entire sample. An interesting finding is that the part-time workers also enjoy industry wage premiums – more so than the full-time workers. Industries that pay full-time workers above their mean wage tend to pay part-time workers above their mean wage as well. This casts doubt on the compensating-wage-differentials story.

Table 12

**Analysis of Estimated Industry Wage Differentials for
Full-Time and Part-Time Workers, Canada, 1986**

	All workers	Full-time workers	Part-time workers	Spearman correlation coefficient
Weighted adjusted standard deviation of industry wage differentials ²	0.151	0.141	0.196	0.546
Sample size	32,945	27,834	5,110	
R^2	0.462	0.469	0.393	

1 Weighted ordinary least squares are used. The other explanatory variables include 5 education dummies, 1 head dummy, 6 age dummies, 3 marital status dummies, 1 sex dummy, 1 education/gender interaction, 6 age/gender interactions, 1 marital status/gender interaction, 13 occupation dummies, 5 regional dummies, 1 union membership dummy, 1 job tenure dummy, 4 employer-size dummies, 1 full-time/part-time job dummy, and a constant. The full-time and part-time industry wage differentials are estimated from a separate cross-section regression.

2 Based on estimated industry wage differentials for two-digit industries. The weights used are the employment shares for 1986.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey, 1986.

Third, our finding of a close similarity across occupations in the pattern of interindustry wage differences is difficult to reconcile with the compensating-differentials argument, since it is unlikely that whenever working conditions are poor for blue-collar workers, they also are poor for managers and clerks.

Fourth, if industry wage premiums reflect compensating differentials and not rents, then there is no added incentive for workers to treat the jobs as being especially valuable. The implication is that there should be no relationship between industry wage premiums and quit rates. The findings that we will present in subsequent sections show that wage premiums are closely associated with lower quit rates. This evidence strongly suggests that workers in high-wage industries receive rents for good jobs or good matches and not merely as compensating differentials.

Institutional Explanations

The extent of unionization across industries is often emphasized as a major cause of interindustry wage differentials. For instance, Krueger and Summers [1988] have argued that interindustry wage differentials may result from the fact that unions can raise wages in certain industries without suffering severe

employment losses (provided the demand for labour is inelastic). This would lead to a higher dispersion of differentials among unionized labour than among nonunionized workers. In fact, the results reported in Table 13, as well as Krueger and Summers' own results, show that this is not the case, nonunionized workers having a greater interindustry wage dispersion than unionized workers. An explanation of this situation is perhaps that unions have had some success in achieving a degree of wage parity among workers with similar characteristics, while there is more arbitrariness in the wage determination of nonunionized workers. More generally, the facts that the correlation is large and that wage dispersion is high for both unionized and nonunionized workers indicate that the extent of unionization is not a major factor in explaining interindustry wage differentials.¹

Table 13

Estimated Industry Wage Differentials for Unionized and Nonunionized Workers,¹ Canada, 1986

	Weighted adjusted standard deviation of industry wage differentials ²	Sample size	R ²	Spearman correlation coefficient
Unionized/ nonunionized sample				0.753
Unionized workers	0.119	12,533	0.370	
Nonunionized workers	0.177	20,411	0.435	

1 Weighted ordinary least squares are used. The other explanatory variables include 5 education dummies, 1 head dummy, 6 age dummies, 3 marital status dummies, 1 sex dummy, 1 education/gender interaction, 6 age/gender interactions, 1 marital status/gender interaction, 13 occupation dummies, 5 regional dummies, 1 union membership dummy, 1 job tenure dummy, 4 employer-size dummies, 1 full-time/part-time job dummy, and a constant. Each row is estimated from a separate cross-section regression.

2 Based on estimated industry wage differentials for two-digit industries. The weights used are the employment shares for 1986.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey, 1986.

Efficiency Wages

From the analysis done so far, it appears that the observed interindustry wage differentials are wage premiums or rents that one would not expect to see if the labour market were functioning in a truly competitive fashion – i.e., if a large number of agents were adjusting their behaviour quickly and independently of each other to changes in their environment. The sizable and persistent wage differentials suggest, on the contrary, that at least some economic agents do not react, or react very slowly, to market conditions. It is generally recognized that labour, as a human production factor, is not traded in the same way that commodities are traded. Although there is some disagreement about the extent to which this peculiarity of the labour market is a major impediment to its competitive functioning, many economists acknowledge that the elements of noncompetition in the labour market are quite important. Involuntary unemployment and wage rigidities are often seen as evidence of that.

The recent literature on efficiency wages helps to explain industry wage differentials.⁹ Several conceptually different but complimentary rationales have been offered for the efficiency-wage hypothesis. These can conveniently be classified into four groups [see, for example, Akerlof and Yellen, 1986]. First, some firms pay a wage that is higher than the competitive wage in order to minimize turnover costs; presumably, workers who receive a high wage are less likely to quit their job than those with a low wage. If firms bear the cost of turnover and if quit rates are a decreasing function of wages paid, premium wages may reduce the cost of hiring, recruiting, and training new workers.

According to a second efficiency-wage model (the "shirking" model), the quantity of effort that employees put into their work is a positive function of the wage. If direct monitoring of performance is difficult, firms may use wages as an incentive to a greater performance rather than increase the amount of monitoring that they do. The basic argument is as follows: if a firm pays wages that are higher than competitive wages, workers will have an incentive not to shirk because, if they lose their job because of shirking, they will be either unemployed or employed at the lower competitive wage. In this model, unemployment can be seen as a worker discipline device.

A third model of efficiency wages focuses on selection effects. According to this view, firms pay higher wages to attract a higher-quality pool of job applicants, since more productive workers have better alternative opportunities. If evaluating worker quality is costly and difficult, then high wages will be desirable.

A fourth model of efficiency wages, called the fairness-wage model, stresses factors such as internal equity, social conventions, and employee's loyalty. These factors lead firms to share their income with all their workers, regardless of the external market conditions that different workers may face. Akerlof and Yellen [1987] present a model where worker morale, loyalty to the firm, and work norms depend on perceived fairness of the wage. The basic notion in this

model is that workers try to get even when they do not get what they think they deserve.

We now turn to a consideration of some empirical evidence on the efficiency-wage theories. The objective here is to demonstrate the potential importance of efficiency-wage arguments, not to distinguish among various rationales for their existence.

One implication of the efficiency-wage models is that there are benefits to firms of sharing rents. High wages may help firms to economize, for example, on turnover costs and shirking. Turnover is costly to firms, as it imposes costs in terms of the search for a suitable employee, lost production during vacancies, and a loss of specific training [see Salop, 1979]. Freeman and Medoff [1984] indicate that the cost savings associated with lower quit rates in the presence of a union is 1 to 2 per cent of labour costs. There also may be indirect gains to firms from lower turnover in terms of enhanced teamwork from continuity in work relationships. Raff and Summers [1987], for example, discuss the introduction of the \$5-a-day pay system at Ford Motor Company in 1914. They note that high turnover was a visible manifestation of problems in the company, with very large consequences for output, and that higher wages led to increases in productivity, large output gains, and reductions in absenteeism and turnover.

An investigation into the relationship between turnover and wage premiums will help to determine whether wage differences represent compensatory differentials or efficiency wages. If wage premiums represent compensating differentials, we would expect to find no relationship between turnover and wage premiums. If, on the other hand, observed wage differentials represent rents, we would expect to find a negative relationship between turnover and industry wage differentials.

To examine this relationship, we estimate a probit model where the dependent variable equals 1 if the worker quit his/her job for nonpersonal reasons in 1986 and 0 if he/she remained on the same job. (See Note 1 in Table 14 for the definition of "nonpersonal reasons.") The major independent variable included in the analysis is the industry wage premium (which is equal to the coefficient reported in Table 2) associated with the individual's industry in 1986. The additional control variables include a union dummy; a full-time job dummy; dummies for job tenure (in months), age, employer size, and occupation; and region dummies. A complete list of these controls is given in Table 14. The results indicate that the industry wage premiums are strongly associated with lower quit rates. This result is consistent with the view that the premiums reflect economic rents to good jobs or good matches and are not merely compensating differentials. It is also consistent with the findings of other researchers [see, for example, Pencavel, 1970, Freeman, 1980, and Krueger and Summers, 1988].

Table 14

**Maximum Likelihood Estimates of Quits¹ and
Industry Wage Differentials, Canada, 1986**

	Probit estimates ²
Independent variables:	
Industry wage premium ³	-0.80 (0.12)
Unionized (1 = yes)	-0.36 (0.03)
Full-time job (1 = yes)	-0.09 (0.03)
Tenure	-0.002 (0.0002)
Age (reference category 25 to 34)	
16 to 19	0.38 (0.11)
20 to 24	0.22 (0.05)
35 to 44	-0.27 (0.04)
45 to 54	-0.40 (0.06)
55 to 64	0.19 (0.06)
Employer size	
20 to 99 employees	0.02 (0.03)
100 to 499 employees	-0.11 (0.04)
500 or more employees	-0.11 (0.03)
Other variables	education, education x gender, age x gender, head dummy, sex dummy, marital status dummies, 13 occupation dummies, region dummies
Sample size	2,681 (for quits)
Log-likelihood	-7,686.3

1 Nonpersonal reasons for leaving one's job include the following: dissatisfaction with the job because of low pay, lack of opportunity for advancement, lack of opportunity to use training or skills, and unsatisfactory working conditions (including physical conditions, transportation problems, and hours or work); concern about layoffs, job security, or reduction in hours; move to a new job; and return to school.

2 Dependent variable: if an individual quits his/her job = 1, otherwise = 0. The figures in parentheses are standard errors.

3 Based on estimated industry wage differentials for two-digit industries.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey, 1986.

Furthermore, if workers in high-wage industries receive economic rents, we would expect to find a positive relationship between the length of job tenure and industry wage differentials since, in effect, longer job tenure reflects a lower turnover rate.

Table 15 reports on the impact of industry wage premiums on job tenure. The coefficient is positive and highly significant. Again, this finding seems to be consistent with the notion that workers in high-wage industries appear to receive rents.¹⁰

Table 15

Job Tenure and Estimated Industry Wage Differentials, Canada, 1986

	Estimated coefficients ¹
Independent variables:	
Industry wage premium ²	26.00 (4.79)
Union (1 = yes)	27.13 (1.02)
Full-time job (1 = yes)	19.22 (1.32)
Age (reference category 25 to 34 years)	
16 to 19	-22.94 (4.50)
20 to 24	-20.15 (2.10)
35 to 44	36.63 (1.56)
45 to 54	81.37 (1.82)
55 to 64	124.85 (2.13)
Employer size	
20 to 99 employees	2.00 (1.26)
100 to 499 employees	14.14 (1.39)
500 or more employees	32.91 (1.32)
Other variables	education, education x sex, age x sex, head dummy, sex dummy, marital status dummies, 13 occupation dummies, region dummies
Sample size	32,887
R ²	0.33

1 Ordinary least squares are used. The dependent variable is job tenure (in months). The mean tenure is 86.25 months. The figures in parentheses are standard errors.

2 Based on estimated differentials for two-digit industries.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Activity Survey, 1986.

IV Implications of Our Findings

Our analysis has important implications that are relevant for policy in the context of the Canadian labour market at the present time.

Interindustry Wage Differentials and Labour Market Segmentation

The focus on the noncompetitive aspects of the labour market may be particularly relevant at the present time, in light of the wage polarization and segmentation in the labour market that has been observed during the 1980s. A disproportionately large number of the new jobs that have been created are nonstandard jobs – i.e., they are either part-time, short-term, or forms of self-employment; they are in the industries of the service sector; and they pay a lower wage than the traditional jobs in the goods-producing industries [see Economic Council of Canada, 1990]. Thus we are in the presence of a labour market increasingly segregated into two distinct segments – "good" jobs and "bad" jobs – a situation that cannot be explained easily by competitive factors. This segmentation could be the result, at least in part, of changes in the distribution of the labour force by industry, the low-wage industries having grown faster than their high-wage counterparts. Our analysis of interindustry wage differentials improves our understanding of that very important trend in today's labour markets.

Table 16 provides some evidence on this issue over the period 1975-89. The table shows the employment shares of high-wage, low-wage, and medium-wage industries in Canada. In Section I of this paper, we identified industries on the basis of estimated interindustry wage differentials at the two-digit level. The reader should recall that although our industry identification into high-wage or low-wage categories is based on our evidence for 1986, we have shown on the basis of census data that the pattern of interindustry wage differentials has been stable over time.

Three messages are drawn from the descriptive evidence presented here. First, the employment share of the high-wage industries was 47 per cent between 1975 and 1980; it declined by about 3 percentage points during the recession and recovery phase of 1982-85; and it has not returned to its prerecessionary levels, despite strong employment growth over the expansionary period. Second, the employment share of medium-wage industries was constant (10 per cent) between 1975 and 1983, but it has declined over the period 1984-89. Finally, low-wage employment increased by just over 3 percentage points during the 1980s in contrast to the period 1975-80.

Table 16

Employment Share of High-, Low-, and Medium-Wage Industries, Canada, 1975-89

	Employment share		
	High-wage ¹	Low-wage ¹	Medium-wage
	(Per cent)		
1975-80	47.0	43.0	10.0
1981-82	45.5	44.5	10.0
1983-85	44.0	46.0	9.3
1986-89	45.0	46.0	9.0

1 Based on estimated industry wage differentials at the two-digit level.

Source Estimates by the authors, based on data from Statistics Canada's Labour Market Surveys.

Our analysis of interindustry wage differentials may also have implications for the dual-labour-market theory. This theory [see Doeringer and Piore, 1971] argues that the labour market can be divided into two segments: the primary sector, characterized by high wages, important fringe benefits, good working conditions, high stability of employment, internal equity of employment, high return to human capital, and so on; and the secondary sector, which has the opposite characteristics. The efficiency-wage theory has important links with the dual-labour-market theory since it can be argued that the primary sector pays efficiency wages, while the secondary sector does not. Therefore, the analysis is relevant to the definition of the dual labour market. A very important conclusion of our analysis is that interindustry wage differentials are very similar for various groups of workers, such as white- and blue-collar, unionized and nonunionized, young and old, etc. This observation may be an argument in favour of defining the primary and secondary markets on the basis of industry. That is so because in high-wage industries *all* kinds of employees receive higher-than-average wages, given their skills, while the converse is true of low-wage industries. In this perspective, it makes sense to equate the primary sector with high-wage industries and the secondary sector with low-wage industries.¹¹

Interindustry Wage Differentials and Unemployment

Our analysis of interindustry wage differentials has shown that there are differences in the wages of equally skilled workers in different industries and that these differentials have been stable over time. In this section, we explore the implications of the existence of these wage differentials for Canada's unemployment performance in the 1980s.

We ask two interrelated questions. First, does the growth of high-wage jobs matter more than the growth of low-wage jobs in reducing the level of unemployment? Second, if so, can the existence of wage differentials help explain the persistence in unemployment over the 1980s?

Summers [1986] has examined unemployment rates across individual states in the United States and found that the growth of high-wage jobs mattered more in reducing the unemployment rate. Two reasons could account for this finding. First, turnover rates tend to be higher for workers in low-wage jobs; in other words, high-wage jobs show greater stability. Second, through spillover effects, high-wage jobs stimulate job creation in other sectors of the economy [see, for example, Gera and Rahman, 1991].

Table 17 presents regressions for the change in unemployment rate on the percentage change in employment, using data for the ten Canadian provinces over the period 1976-89 and 1981-89. The results show that over the period 1976-89, changes in employment in high-wage industries had twice as much impact on unemployment rates as employment growth in low-wage industries. For example, 10-per-cent employment growth in high-wage industries in a province would have reduced that province's unemployment rate by 1.1 percentage point; by contrast, the same increase in employment in low-wage industries would have led to only a 0.6-percentage-point reduction in the provincial unemployment rate.¹² The results in Table 17 also reveal that over the period 1981-89, low-wage employment growth did have an impact on the unemployment rate.

Table 17

Employment Growth and Changes in Unemployment, Canada, 1976-89¹

	1976-89	1981-89
Model 1		
Percentage change in total employment ²	-0.09 (4.63)	-0.12 (4.70)
R ²	0.14	0.20
Model 2		
Percentage change in high-wage employment	-0.11 (3.88)	-0.13 (3.46)
Percentage change in non-high-wage employment	-0.06 (1.80)	-0.11 (2.03)
R ²	0.14	0.20

1 The dependent variable is the difference in provincial unemployment rates.

2 Based on regional employment data for 46 industries; the figures in parentheses are *t*-statistics.

Source Estimates by the authors, based on Statistics Canada's Labour Market Surveys.

Table 18 shows the employment and unemployment experience of Canada and, by way of illustration, the province of Ontario, based on data for 46 industries. Between 1976 and 1989, the rate of unemployment in Canada increased slightly, despite the fact that low-wage employment increased by 4 percentage points while high-wage employment decreased by 2 points. In Ontario, the rate of unemployment fell over the same period, mainly because low-wage employment increased, while high-wage employment was relatively unchanged.

Table 18

Employment Growth and Unemployment in Canada and Ontario, 1976-89

	Change in unemployment rate	Change in employment ¹	Change in the ratio of:		Change in labour force
			High-wage employment to total employment	Low-wage employment to total employment	
	(Percentage points)	(Per cent)	(Percentage points)		(Per cent)
Canada					
1976-89	0.4	34.6	-2.0	4.0	32.3
1981-89	--	15.0	-1.0	2.0	13.5
1985-89	-3.0	12.7	1.0	--	7.8
Ontario					
1976-89	-1.1	38.9	-0.3	2.0	34.3
1981-89	-1.5	20.6	1.0	--	16.8
1985-89	-2.9	14.4	1.0	-1.0	9.6

1 Employment data based on 46 industries.

Source Estimates by the authors, based on data from Statistics Canada's Labour Force Surveys.

The strong positive impact of high-wage employment growth on the unemployment rate becomes even clearer when the focus is on its contribution in the 1980s. In Canada, between 1981 and 1989, the share of low-wage employment in total employment increased by 2 percentage points, the share of high-wage employment decreased by 1 percentage point, and the unemployment rate remained unchanged. In 1985-89, however, the share of low-wage unemployment did not change, the share of high-wage employment increased by 1 percentage point, and the unemployment rate fell by a full 3 percentage

points. A similar pattern was shown in Ontario, where stable or declining shares of low-wage employment, coupled with growing shares of high-wage employment, resulted in substantial decreases in the rate of unemployment.

These findings are instructive. What they suggest is that while overall employment growth matters for a reduction in the rate of unemployment, what matters much more is growth in high-wage jobs.

Can this differential response of unemployment to high-wage and low-wage employment growth help explain the persistence of unemployment in the 1980s? One piece of important evidence here is the job losses and gains observed in these sectors during the 1980s. The high-wage industries were slow to recover from the severity of the recessionary shock. The high-wage sector lost some 400,000 jobs during 1981-83 and did not regain them until 1986. In contrast, the low-wage sector gained some 45,000 new jobs between 1981 and 1983 and during the remainder of the 1980s, 800,000 more jobs. But still, the overall unemployment rate was slow to decline. The slow pace of job generation in the high-wage industries, then, combined with the greater impact of high-wage employment growth on total unemployment, may help to explain why unemployment in the 1980s in Canada was so persistent.

It has been argued that workers displaced from the high-wage sector would rather wait for a high-wage job than accept a less attractive low-wage job, thus contributing to a longer duration of unemployment.¹³ One reason for this behaviour is that workers losing high-wage jobs may feel that accepting a low-wage job would signal to potential high-wage employers that they are not qualified for better jobs, so reducing their chances of employment in the high-wage sector. Moreover, in the presence of generous unemployment insurance benefits, it may be more efficient to search full-time for a new job while unemployed than while working. In a recent study of Canadian males, Ham and Rae [1987] find that the behaviour of individuals is influenced by the duration of their potential unemployment insurance benefits. As the point of benefit exhaustion approaches, individuals tend to search more intensively for a job. In other words, the average search intensity while unemployed is negatively related to the number of weeks of benefit entitlement.

V Summary and Conclusions

The main results of the analysis presented in this paper can be summarized as follows:

- First, interindustry wage differentials do exist and are relatively stable over time. In addition, the pattern of industry wage differentials is very similar for both white- and blue-collar workers.
- Second, these differentials cannot be explained by compensating factors. The finding that the interindustry wage structure is the same for workers

performing different tasks provides strong evidence against compensating differentials.

- Third, these differentials are consistent with the rent-sharing explanations of the labour market, such as those based on the notion of efficiency wages.
- Fourth, a reduction in high-wage employment increases unemployment; however, that higher unemployment is not equally offset by employment growth in low-wage industries.

Two factors may have contributed to persistence in unemployment in the 1980s. First, wage rigidity in the high-wage industries may have contributed to job loss in this sector in the 1980s. Second, the evidence suggests that the workers who were displaced from those high-wage jobs may have remained unemployed longer in order to regain employment in the high-wage sector; moreover, their search intensity was lower during the initial weeks of unemployment and increased only as the point of benefit-exhaustion approached.

These findings lead us to conclude that policies that can improve the health of the high-wage sector – in particular, the manufacturing sector – can help to reduce unemployment. Furthermore, since the shocks or policies that harm high-wage industries can, potentially, generate persistent unemployment, a legitimate concern may well be whether stabilization policies should include an analysis of the potential impact on different sectors of the economy.

The existence of industry wage premiums or rents also has important implications for industrial and trade policy. The recent literature in the United States suggests that export industries tend to be high-wage and that export promotion would raise national productivity and real wages [see, for example, Lawrence and Schultze, 1990]. The argument is that some industries – such as those in the high-technology sector – are more important than others and that market forces on their own will not channel sufficient resources into the critical high-technology industries. As a result, the more supportive trade and industrial policies of other countries will drive U.S. producers out of these important sectors and so lower the U.S. standard of living. These advocates argue for industrial policies aimed at such high-wage sectors.

Notes

- 1 For a more complete review, see Chapters 16 and 21 of Gunderson and Riddell [1988]; OECD [1985]; and Dahrendorf et al. [1986].
- 2 The Labour Market Activity Survey (LMAS) of 1986 reports up to a maximum of five jobs per individual during 1986. However, the number of observations for the third, fourth, and fifth jobs held is too low for meaningful statistical analysis. For this reason, most of the evidence provided considers first job experiences only. It is important to clarify the meaning of the term "first job." It does not necessarily refer to the very first job ever held but to the first job held in 1986, regardless of when the job started. However, it may very well be that the first job in 1986 was in fact the first job ever for some individuals.
- 3 For a detailed review of compensating wage differentials, see Digby and Riddell [1986].
- 4 The size and dispersion of wage differentials, however, are higher with the census data than with the LMAS data (see Table 1). This difference is related to the fact that a larger set of control variables is used in the LMAS than in the census and that the dependent variable in the census data is the annual wage, whereas it was the hourly wage in the LMAS data. Although the census regressions include dummy variables to account for hours and weeks worked, these variables capture only part of the variation explained by hours worked.
- 5 Murphy and Topel [1987] developed a statistical procedure for assessing the potential importance of unobserved labour quality in driving the wage differentials. Their results lead them to conclude that unobserved ability accounts for the bulk of industry wage differentials. These findings have been questioned by Katz and Summers [1989].
- 6 Krueger and Summers [1987] and Dickens and Katz [1987] argue that the evidence of the regularities in the industry wage structure over time and space, combined with the finding that more profitable industries pay higher wages, casts further doubt on the unmeasured labour quality explanation for wage differentials. They question the view that there is a correlation between unmeasured labour quality and product market characteristics.
- 7 Workers may be compensated for differences in unemployment risk across industries. Murphy and Topel [1987] find that this factor accounts for only quite a small fraction of industry wage differentials.
- 8 A referee suggested that the correlation between union and nonunion wages may reflect the effect of union threats. The higher dispersion in nonunion wages may be due to the product-market characteristics of industries.

- 9 In the recent literature, two other rent-sharing explanations – insider/outsider models, and the union-threat model – have also been proposed as possible explanations of industry wage differentials. Insider/outsider models are based on two arguments: 1) that the turn-over costs associated with hiring, training, and firing workers discourage firms from replacing existing workers (insiders) with unemployed workers (outsiders); and 2) that insiders are able to influence the wage-bargaining process without taking into account the interests of outsiders. A key implication of both arguments is that the influence of insiders in the wage-setting process prevents firms from reducing wages in the face of an excess supply of labour. As a result, unemployment may persist even in the face of high levels of unemployment overall. For a detailed discussion of insider/outsider models, see Blanchard and Summers [1986]; Solow [1985]; Linkbeck and Snower [1986]; and Katz [1988]. The union-threat model of Dickens [1986] argues that wage premiums may also be related to the presence of unions or to the threat of collective action by workers. Firms may find it profitable to pay higher-than-competitive wages to unionized workers in order to prevent strikes and maintain industrial peace.
- 10 Carmichael [1990] points out that other models could also lead to the same conclusions. Therefore, the conclusion that can be drawn from this is that the existence of large interindustry wage differentials is certainly consistent with the efficiency-wage models, but it does not, in itself, prove the validity of those models.
- 11 Katz [1986] argues that the "shirking" model of efficiency wages also provides a rationale for segmented labour markets with a wage differential for similar workers across the primary and secondary sectors and rationing of primary sector jobs. Jones [1987] argues that efficiency-wage considerations are important when it is expensive for primary-sector employers to monitor the efforts of workers. Employers then find it optimal to hire from the pool of the unemployed, using the acceptance of low-wage jobs as a device to screen out the less motivated individuals. The evidence in our paper does support the idea that higher turnover rates are associated with low-paying jobs. For additional reference on this issue, see Bulow and Summers [1986].
- 12 Employment growth will not lead to equal percentage reductions in unemployment if it is associated either with population growth or with increase in labour force participation.
- 13 Summer [1986] suggested this notion of "transitional unemployment" while explaining the unemployment patterns of males in the United States. The concept of transitional unemployment (or "wait unemployment") had been proposed by Hall [1975]. This view dates back to the seminal work of Harris and Todaro [1970] in the context of underdeveloped economies. For some other models along the similar lines, see McDonald and Solow [1985], and Dickens and Lang [1985, 1988].

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